

Building Site Development
Emmons County, North Dakota

Soil properties influence the development of building sites, including the selection of the site, the design of the structure, construction, performance after construction, and maintenance. The following tables show the degree and kind of soil limitations that affect dwellings with and without basements, small commercial buildings, local roads and streets, shallow excavations, and lawns and landscaping.

Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect building site development. Not limited indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. Slight indicates that the soil has features that are favorable for the specified use. The limitations are minor and can be easily overcome. Good performance and low maintenance can be expected. Moderate indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. Severe indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Dwellings are single-family houses of three stories or less. For dwellings without basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. For dwellings with basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of about 7 feet. The ratings for dwellings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility. Compressibility is inferred from the Unified classification. The properties that affect the ease and amount of excavation include depth to a water table, ponding, flooding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

Small commercial buildings are structures that are less than three stories high and do not have basements. The foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. The ratings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility (which is inferred from the Unified classification). The properties that affect the ease and amount of excavation include flooding, depth to a water table, ponding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or soil material stabilized by lime or cement; and a surface of flexible material (asphalt), rigid material (concrete), or gravel with a binder. The ratings are based on the soil properties that affect the ease of excavation and grading and the traffic-supporting capacity. The properties that affect the ease of excavation and grading are depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, depth to a water table, ponding, flooding, the amount of large stones, and slope. The properties that affect the traffic-supporting capacity are soil strength (as inferred from the AASHTO group index number), subsidence, linear extensibility (shrink-swell potential), the potential for frost action, depth to a water table, and ponding.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for graves, utility lines, open ditches, or other purposes. The ratings are based on the soil properties that influence the ease of digging and the resistance to sloughing. Depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, the amount of large stones, and dense layers influence the ease of digging, filling, and compacting. Depth to the seasonal high water table, flooding, and ponding may restrict the period when excavations can be made. Slope influences the ease of using machinery. Soil texture, depth to the water table, and linear extensibility (shrink-swell potential) influence the resistance to sloughing.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. Irrigation is not considered in the ratings. The ratings are based on the soil properties that affect plant growth and trafficability after vegetation is established. The properties that affect plant growth are reaction; depth to a water table; ponding; depth to bedrock or a cemented pan; the available water capacity in the upper 40 inches; the content of salts, sodium, or calcium carbonate; and sulfidic materials. The properties that affect trafficability are flooding, depth to a water table, ponding, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer.

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| Map symbol and soil name | Shallow excavations | Dwellings without basements | Dwellings with basements | Small commercial buildings | Local roads and streets | Lawns and landscaping |
|-----------------------------|-------------------------------------|---|--------------------------------------|------------------------------------|---|--|
| 3: Regan----- | Severe: wetness | Severe: flooding wetness | Severe: flooding wetness | Severe: flooding wetness | Severe: flooding low strength wetness | Severe: flooding wetness |
| 6B: Niobell----- | Moderate: wetness | Moderate: shrink-swell | Moderate: shrink-swell wetness | Moderate: shrink-swell | Moderate: frost action low strength shrink-swell | Severe: excess sodium |
| 8: Heil----- | Severe: ponding cutbanks cave | Severe: shrink-swell ponding | Severe: shrink-swell ponding | Severe: shrink-swell ponding | Severe: low strength shrink-swell ponding | Severe: excess sodium ponding |
| 9: Tonka----- | Severe: ponding | Severe: shrink-swell ponding | Severe: shrink-swell ponding | Severe: shrink-swell ponding | Severe: low strength shrink-swell ponding | Severe: ponding |
| 10: Parnell----- | Severe: excess humus ponding | Severe: shrink-swell ponding | Severe: shrink-swell ponding | Severe: shrink-swell ponding | Severe: low strength shrink-swell ponding | Severe: ponding |
| 11: Straw----- | Severe: cutbanks cave | Severe: flooding | Severe: flooding | Severe: flooding | Severe: flooding | Severe: flooding |
| Channeled----- | --- | --- | --- | --- | --- | --- |
| 12: Neché Variant----- | Severe: wetness | Severe: flooding wetness | Severe: flooding wetness | Severe: flooding wetness | Severe: flooding frost action wetness | Severe: flooding wetness |
| 13: Arnegard----- | Slight | Moderate: shrink-swell | Slight | Moderate: shrink-swell | Severe: low strength | Slight |
| 13B: Arnegard----- | Slight | Moderate: shrink-swell | Slight | Moderate: shrink-swell slope | Severe: low strength | Slight |
| 15D: Cabba----- | Severe: depth to rock | Moderate: shrink-swell slope depth to rock | Severe: depth to rock | Severe: slope | Moderate: shrink-swell slope depth to rock | Severe: depth to rock |
| Amor----- | Moderate: slope | Moderate: shrink-swell slope | Moderate: shrink-swell slope | Severe: slope | Severe: low strength | Moderate: area reclaim slope thin layer |
| 15E: Cabba----- | Severe: slope depth to rock | Severe: slope | Severe: slope depth to rock | Severe: slope | Severe: slope | Severe: slope depth to rock |
| Amor----- | Severe: slope | Severe: slope | Severe: slope | Severe: slope | Severe: low strength slope | Severe: slope |
| 17: Stady----- | Severe: cutbanks cave | Slight | Slight | Slight | Slight | Slight |
| Lehr----- | Severe: cutbanks cave | Slight | Slight | Slight | Slight | Moderate: droughty |

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| Map symbol and soil name | Shallow excavations | Dwellings without basements | Dwellings with basements | Small commercial buildings | Local roads and streets | Lawns and landscaping |
|-----------------------------|------------------------------------|-------------------------------------|--------------------------------|------------------------------------|---|--|
| 17B: Stady----- | Severe: cutbanks cave | Slight | Slight | Moderate: slope | Slight | Slight |
| Lehr----- | Severe: cutbanks cave | Slight | Slight | Moderate: slope | Slight | Moderate: droughty |
| 17C: Stady----- | Severe: cutbanks cave | Slight | Slight | Moderate: slope | Slight | Slight |
| Lehr----- | Severe: cutbanks cave | Slight | Slight | Moderate: slope | Slight | Moderate: droughty |
| 18B: Reeder----- | Slight | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell slope | Moderate: low strength shrink-swell | Moderate: area reclaim thin layer |
| Rhoades----- | Moderate: too clayey | Severe: shrink-swell | Severe: shrink-swell | Severe: shrink-swell | Severe: low strength shrink-swell | Severe: excess sodium |
| 18C: Reeder----- | Slight | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell slope | Moderate: low strength shrink-swell | Moderate: area reclaim thin layer |
| Rhoades----- | Moderate: too clayey | Severe: shrink-swell | Severe: shrink-swell | Severe: shrink-swell | Severe: low strength shrink-swell | Severe: excess sodium |
| 19: Straw----- | Severe: cutbanks cave | Severe: flooding | Severe: flooding | Severe: flooding | Moderate: flooding frost action | Slight |
| 21: Shambo----- | Slight | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: low strength shrink-swell | Slight |
| 21B: Shambo----- | Slight | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell slope | Moderate: low strength shrink-swell | Slight |
| 22: Belfield----- | Moderate: too clayey wetness | Severe: shrink-swell | Severe: shrink-swell | Severe: shrink-swell | Severe: low strength shrink-swell | Severe: excess sodium |
| Daglun----- | Moderate: too clayey | Severe: shrink-swell | Severe: shrink-swell | Severe: shrink-swell | Severe: low strength shrink-swell | Severe: excess sodium |
| 22B: Belfield----- | Moderate: too clayey wetness | Severe: shrink-swell | Severe: shrink-swell | Severe: shrink-swell | Severe: low strength shrink-swell | Severe: excess sodium |
| Daglun----- | Moderate: too clayey | Severe: shrink-swell | Severe: shrink-swell | Severe: shrink-swell | Severe: low strength shrink-swell | Severe: excess sodium |
| 23D: Vebar----- | Severe: cutbanks cave | Moderate: slope | Moderate: slope | Severe: slope | Moderate: slope | Moderate: area reclaim slope thin layer |
| Cohagen----- | Severe: depth to rock | Moderate: slope depth to rock | Severe: depth to rock | Severe: slope | Moderate: frost action slope depth to rock | Severe: depth to rock |

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| Map symbol and soil name | Shallow excavations | Dwellings without basements | Dwellings with basements | Small commercial buildings | Local roads and streets | Lawns and landscaping |
|-----------------------------|-----------------------------------|------------------------------------|--------------------------------------|------------------------------------|--|-------------------------------------|
| 23E: Vebar----- | Severe: slope cutbanks cave | Severe: slope | Severe: slope | Severe: slope | Severe: slope | Severe: slope |
| Cohagen----- | Severe: slope depth to rock | Severe: slope | Severe: slope depth to rock | Severe: slope | Severe: slope | Severe: slope depth to rock |
| 24: Grassna----- | Moderate: wetness | Moderate: shrink-swell | Moderate: shrink-swell wetness | Moderate: shrink-swell | Severe: low strength | Slight |
| 24B: Grassna----- | Moderate: wetness | Moderate: shrink-swell | Moderate: shrink-swell wetness | Moderate: shrink-swell slope | Severe: low strength | Slight |
| 25B: Flaxton----- | Severe: cutbanks cave | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell | Severe: low strength | Slight |
| 25C: Flaxton----- | Severe: cutbanks cave | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell slope | Severe: low strength | Slight |
| 25D: Flaxton----- | Severe: cutbanks cave | Moderate: shrink-swell slope | Moderate: shrink-swell slope | Severe: slope | Severe: low strength | Moderate: slope |
| 26B: Krem----- | Severe: cutbanks cave | Slight | Moderate: shrink-swell | Slight | Moderate: frost action | Slight |
| 26C: Krem----- | Severe: cutbanks cave | Slight | Moderate: shrink-swell | Moderate: slope | Moderate: frost action | Slight |
| 28: Grail----- | Moderate: too clayey | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell | Severe: low strength | Slight |
| 29: Harriet----- | Severe: wetness | Severe: flooding wetness | Severe: flooding wetness | Severe: flooding wetness | Severe: flooding low strength wetness | Severe: excess sodium wetness |
| 31: Parnell, PONDED----- | Severe: ponding | Severe: shrink-swell ponding | Severe: shrink-swell ponding | Severe: shrink-swell ponding | Severe: low strength shrink-swell ponding | Severe: ponding |
| 32B: Lihen----- | Severe: cutbanks cave | Slight | Slight | Slight | Slight | Moderate: droughty |
| 32C: Lihen----- | Severe: cutbanks cave | Slight | Slight | Moderate: slope | Slight | Moderate: droughty |
| 33B: Parshall----- | Severe: cutbanks cave | Slight | Slight | Slight | Moderate: frost action | Slight |
| Lihen----- | Severe: cutbanks cave | Slight | Slight | Slight | Slight | Moderate: droughty |
| 33C: Parshall----- | Severe: cutbanks cave | Slight | Slight | Moderate: slope | Moderate: frost action | Slight |

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| Map symbol and soil name | Shallow excavations | Dwellings without basements | Dwellings with basements | Small commercial buildings | Local roads and streets | Lawns and landscaping |
|----------------------------------|--------------------------|---|------------------------------------|---|---|--|
| Lihen----- | Severe: cutbanks cave | Slight | Slight | Moderate: slope | Slight | Moderate: droughty |
| 35C: Sutley----- | Slight | Slight | Slight | Moderate: slope | Moderate: frost action | Slight |
| 35E: Sutley----- | Severe: slope | Severe: slope | Severe: slope | Severe: slope | Severe: slope | Severe: slope |
| 36B: Bryant----- | Slight | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell slope | Severe: low strength | Slight |
| 36C: Bryant----- | Slight | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell slope | Severe: low strength | Slight |
| 40C: Amor----- | Slight | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell slope | Severe: low strength | Moderate: area reclaim thin layer |
| Cabba----- | Severe: depth to rock | Moderate: shrink-swell depth to rock | Severe: depth to rock | Moderate: shrink-swell slope depth to rock | Moderate: shrink-swell depth to rock | Severe: depth to rock |
| 40D: Amor----- | Moderate: slope | Moderate: shrink-swell slope | Moderate: shrink-swell slope | Severe: slope | Severe: low strength | Moderate: area reclaim slope thin layer |
| Cabba----- | Severe: depth to rock | Moderate: shrink-swell slope depth to rock | Severe: depth to rock | Severe: slope | Moderate: shrink-swell slope depth to rock | Severe: depth to rock |
| 41: Reeder----- | Slight | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: low strength shrink-swell | Moderate: area reclaim thin layer |
| 41B: Reeder----- | Slight | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell slope | Moderate: low strength shrink-swell | Moderate: area reclaim thin layer |
| 41C: Reeder----- | Slight | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell slope | Moderate: low strength shrink-swell | Moderate: area reclaim thin layer |
| 41D: Reeder----- | Moderate: slope | Moderate: shrink-swell slope | Moderate: shrink-swell slope | Severe: slope | Moderate: low strength shrink-swell slope | Moderate: area reclaim slope thin layer |
| 43D: Reeder, EXTREMELY STONY- | Moderate: slope | Moderate: shrink-swell slope | Moderate: shrink-swell slope | Severe: slope | Moderate: low strength shrink-swell slope | Moderate: large stones slope |
| 44: Daglum----- | Moderate: too clayey | Severe: shrink-swell | Severe: shrink-swell | Severe: shrink-swell | Severe: low strength shrink-swell | Severe: excess sodium |
| Rhoades----- | Moderate: too clayey | Severe: shrink-swell | Severe: shrink-swell | Severe: shrink-swell | Severe: low strength shrink-swell | Severe: excess sodium |

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| Map symbol and soil name | Shallow excavations | Dwellings without basements | Dwellings with basements | Small commercial buildings | Local roads and streets | Lawns and landscaping |
|-----------------------------|----------------------------------|-----------------------------------|--------------------------------------|----------------------------------|---|----------------------------------|
| 44C: Daglum----- | Moderate: too clayey | Severe: shrink-swell | Severe: shrink-swell | Severe: shrink-swell | Severe: low strength shrink-swell | Severe: excess sodium |
| Rhoades----- | Moderate: too clayey | Severe: shrink-swell | Severe: shrink-swell | Severe: shrink-swell | Severe: low strength shrink-swell | Severe: excess sodium |
| 46B: Regent----- | Moderate: too clayey | Severe: shrink-swell | Severe: shrink-swell | Severe: shrink-swell | Severe: low strength shrink-swell | Moderate: thin layer |
| Daglum----- | Moderate: too clayey | Severe: shrink-swell | Severe: shrink-swell | Severe: shrink-swell | Severe: low strength shrink-swell | Severe: excess sodium |
| 46C: Regent----- | Moderate: too clayey | Severe: shrink-swell | Severe: shrink-swell | Severe: shrink-swell | Severe: low strength shrink-swell | Moderate: thin layer |
| Daglum----- | Moderate: too clayey | Severe: shrink-swell | Severe: shrink-swell | Severe: shrink-swell | Severe: low strength shrink-swell | Severe: excess sodium |
| 47B: Manning----- | Severe: cutbanks cave | Slight | Slight | Slight | Slight | Moderate: droughty |
| 49B: Telfer----- | Severe: cutbanks cave | Slight | Slight | Slight | Slight | Moderate: droughty |
| 51B: Noonan----- | Moderate: wetness | Moderate: shrink-swell | Moderate: shrink-swell wetness | Moderate: shrink-swell | Severe: low strength | Severe: excess sodium |
| 53: Bearpaw----- | Moderate: too clayey | Severe: shrink-swell | Severe: shrink-swell | Severe: shrink-swell | Severe: low strength shrink-swell | Slight |
| 53B: Bearpaw----- | Moderate: too clayey | Severe: shrink-swell | Severe: shrink-swell | Severe: shrink-swell | Severe: low strength shrink-swell | Slight |
| 53C: Bearpaw----- | Moderate: too clayey | Severe: shrink-swell | Severe: shrink-swell | Severe: shrink-swell | Severe: low strength shrink-swell | Slight |
| 54: Regent----- | Moderate: too clayey | Severe: shrink-swell | Severe: shrink-swell | Severe: shrink-swell | Severe: low strength shrink-swell | Moderate: thin layer |
| 54B: Regent----- | Moderate: too clayey | Severe: shrink-swell | Severe: shrink-swell | Severe: shrink-swell | Severe: low strength shrink-swell | Moderate: thin layer |
| 54C: Regent----- | Moderate: too clayey | Severe: shrink-swell | Severe: shrink-swell | Severe: shrink-swell | Severe: low strength shrink-swell | Moderate: thin layer |
| 54D: Regent----- | Moderate: slope too clayey | Severe: shrink-swell | Severe: shrink-swell | Severe: shrink-swell slope | Severe: low strength shrink-swell | Moderate: slope thin layer |

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|-----------------------------|-----------------------------------|------------------------------------|------------------------------------|------------------------------------|---|--|
| 55C: Rhoades----- | Moderate: too clayey | Severe: shrink-swell | Severe: shrink-swell | Severe: shrink-swell | Severe: low strength shrink-swell | Severe: excess sodium |
| 58: Bowdle----- | Severe: cutbanks cave | Slight | Slight | Slight | Moderate: frost action | Slight |
| 58B: Bowdle----- | Severe: cutbanks cave | Slight | Slight | Moderate: slope | Moderate: frost action | Slight |
| 60B: Farland----- | Severe: cutbanks cave | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell | Severe: low strength | Slight |
| 62: Amor----- | Slight | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell | Severe: low strength | Moderate: area reclaim thin layer |
| 62B: Amor----- | Slight | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell slope | Severe: low strength | Moderate: area reclaim thin layer |
| 62C: Amor----- | Slight | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell slope | Severe: low strength | Moderate: area reclaim thin layer |
| 62D: Amor----- | Moderate: slope | Moderate: shrink-swell slope | Moderate: shrink-swell slope | Severe: slope | Severe: low strength | Moderate: area reclaim slope thin layer |
| 63D: Wabek----- | Severe: cutbanks cave | Moderate: slope | Moderate: slope | Severe: slope | Moderate: slope | Moderate: slope droughty |
| 64: Wilton----- | Slight | Slight | Moderate: shrink-swell | Slight | Moderate: frost action low strength | Slight |
| 64B: Temvik----- | Slight | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell slope | Moderate: low strength shrink-swell | Slight |
| 64C: Temvik----- | Slight | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell slope | Moderate: low strength shrink-swell | Slight |
| 66C: Seroco----- | Severe: cutbanks cave | Slight | Slight | Moderate: slope | Slight | Moderate: droughty |
| 66E: Seroco----- | Severe: slope cutbanks cave | Severe: slope | Severe: slope | Severe: slope | Severe: slope | Severe: slope |
| 67B: Vebar----- | Severe: cutbanks cave | Slight | Slight | Slight | Slight | Moderate: area reclaim thin layer |
| 67C: Vebar----- | Severe: cutbanks cave | Slight | Slight | Moderate: slope | Slight | Moderate: area reclaim thin layer |

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|-----------------------------|--------------------------|-----------------------------------|--------------------------------|------------------------------------|---|--|
| 67D: Vebar----- | Severe: cutbanks cave | Moderate: slope | Moderate: slope | Severe: slope | Moderate: slope | Moderate: area reclaim slope thin layer |
| 70: Williams----- | Slight | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell | Severe: low strength | Slight |
| Bowbells----- | Slight | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell | Severe: low strength | Slight |
| 70B: Williams----- | Slight | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell slope | Severe: low strength | Slight |
| Bowbells----- | Slight | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell slope | Severe: low strength | Slight |
| 70C: Williams----- | Slight | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell slope | Severe: low strength | Slight |
| 72: Williams----- | Slight | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell | Severe: low strength | Slight |
| Reeder----- | Slight | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: low strength shrink-swell | Moderate: area reclaim thin layer |
| 72B: Williams----- | Slight | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell slope | Severe: low strength | Slight |
| Reeder----- | Slight | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell slope | Moderate: low strength shrink-swell | Moderate: area reclaim thin layer |
| 72C: Williams----- | Slight | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell slope | Severe: low strength | Slight |
| Reeder----- | Slight | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell slope | Moderate: low strength shrink-swell | Moderate: area reclaim thin layer |
| 73C: Williams----- | Slight | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell slope | Severe: low strength | Slight |
| Zahl----- | Slight | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell slope | Severe: low strength | Slight |
| 73E: Williams----- | Severe: slope | Severe: slope | Severe: slope | Severe: slope | Severe: low strength slope | Severe: slope |
| Zahl----- | Severe: slope | Severe: slope | Severe: slope | Severe: slope | Severe: low strength slope | Severe: slope |
| 79D: Telfer----- | Severe: cutbanks cave | Moderate: slope | Moderate: slope | Severe: slope | Moderate: slope | Moderate: slope droughty |

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|-------------------------------|-------------------------------------|--|--|--|--|--|
| Flasher----- | Moderate: slope | Moderate: slope | Moderate: slope | Severe: slope | Moderate: slope | Severe: area reclaim thin layer |
| 79E: Flasher----- | Severe: slope | Severe: slope | Severe: slope | Severe: slope | Severe: slope | Severe: area reclaim slope thin layer |
| Telfer----- | Severe: slope cutbanks cave | Severe: slope | Severe: slope | Severe: slope | Severe: slope | Severe: slope |
| 82: Arveson----- | Severe: wetness cutbanks cave | Severe: wetness | Severe: wetness | Severe: wetness | Severe: frost action wetness | Severe: wetness |
| 84: Havrelon, VARIANT----- | Severe: wetness | Severe: flooding | Severe: flooding wetness | Severe: flooding | Severe: flooding low strength | Moderate: flooding |
| 85: Hamerly----- | Severe: wetness | Moderate: shrink-swell wetness | Severe: wetness | Moderate: shrink-swell wetness | Severe: frost action | Slight |
| 88: Lallie----- | Severe: wetness | Severe: flooding shrink-swell wetness | Severe: flooding shrink-swell wetness | Severe: flooding shrink-swell wetness | Severe: low strength shrink-swell wetness | Severe: flooding wetness |
| 93B: Ekalaka----- | Severe: cutbanks cave | Slight | Slight | Slight | Moderate: frost action | Severe: excess sodium |
| 98: Banks, VARIANT----- | Severe: cutbanks cave | Severe: flooding | Severe: flooding | Severe: flooding | Severe: flooding | Severe: flooding |
| 162: Omio----- | Slight | Slight | Slight | Slight | Severe: low strength | Moderate: area reclaim thin layer |
| Grassna----- | Moderate: wetness | Moderate: shrink-swell | Moderate: shrink-swell wetness | Moderate: shrink-swell | Severe: low strength | Slight |
| 162B: Omio----- | Slight | Slight | Slight | Moderate: slope | Severe: low strength | Moderate: area reclaim thin layer |
| Amor----- | Slight | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell slope | Severe: low strength | Moderate: area reclaim thin layer |
| 162C: Omio----- | Slight | Slight | Slight | Moderate: slope | Severe: low strength | Moderate: area reclaim thin layer |
| Amor----- | Slight | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell slope | Severe: low strength | Moderate: area reclaim thin layer |
| 164: Williams----- | Slight | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell | Severe: low strength | Slight |
| Falkirk----- | Severe: cutbanks cave | Slight | Moderate: shrink-swell | Slight | Moderate: frost action | Slight |

Building Site Development--Continued
Emmons County, North Dakota

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable.)

| Map symbol and soil name | Shallow excavations | Dwellings without basements | Dwellings with basements | Small commercial buildings | Local roads and streets | Lawns and landscaping |
|-----------------------------|--------------------------|-----------------------------------|--------------------------------|------------------------------------|----------------------------|--------------------------|
| 164B: Williams----- | Slight | Moderate: shrink-swell | Moderate: shrink-swell | Moderate: shrink-swell slope | Severe: low strength | Slight |
| Falkirk----- | Severe: cutbanks cave | Slight | Moderate: shrink-swell | Moderate: slope | Moderate: frost action | Slight |
| W: Water----- | --- | --- | --- | --- | --- | --- |

